TZ-VN06 (Standard)
User Guide
V1.0.3
Automatic Vehicle Location

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1 Product Overview

VN06 is a GPS/GSM/GPRS tracking device which is specially developed and designed for vehicle real-time tracking and security. With superior GPS and GPRS modules, VN06 has good sensitivity and stable performance. It can get accurate GPS fix even in remote places.

1.1 Key Features

- **High sensitive SIRFIII Star GPS Chipset and advanced multi-band GSM module;**
- **GPS/GSM/GPRS/SMS connection;**
- **Remote control via mobile phone or computer;**
- **Fast signal acquisition;**
- **Excellent locating capability under weak signal enviroment;**
- **Locate single waypoint or track continuously;**
- **Locate at preset time interval or real time;**
- **Living tracking on map;**
- **Send SOS message for emergency rescue;**
- **Send low power notification when battery will die out;**
- **Send over speed alarm when vehicle moves over restricted speed;**
- **Send geo-fence alarm when vehicle exits or enters restricted area;**
- **Build-in motion sensor;**
- **Sleep when no motion;**
- **Send parking alarm when someone move vehicle;**
- **Detect working status periodically like hear-beat rate;**
- **Send power disconnection alarm when someone cuts off power line;**
- **Cut off engine instantly or in on-off mode when someone drives vehicle;**
- **Turn on or off door-lock;**
- **Measure oil, water temperature and air temperature;**
- **Detect on/off status such as engine, ACC, doors etc;**
- **With 32M memory, this can store about 16000 PCS data. When GPRS is lose connection, those data will be store and send when GPRS connection is recover.**
- **Monitor enviroment voice;;**
- **Find out the GSM cell ID which SIM card is currently attached to;**

- **Odometer;**
- **Connect serial port devices such as camera, RFID reader and printer etc,can insert the SD card related operations;**
- **2 switch inputs, 2 analog inputs, 2 digital inputs, 3 digital outputs, 2 serial inputs and 1 mini USB port;**
- **Set parameters via mobile phone or configuration software;**
- **Update firmware via hyper terminal;**
- **Rechargeable li-polymer battery;**
- **TCP/UDP protocol;**
- **Perfect manage application for car, taxi, bus, truck, van and trailer etc;**
- **print default for Vietnamese;**
- **In accordance with the time or random to print speed**
- **SD card recorded files can be output through the serial port**
- **According to the engine on or off as began to drive or stop driving**
- **Car over speeding will lead to Beep until the alarm disappear and**

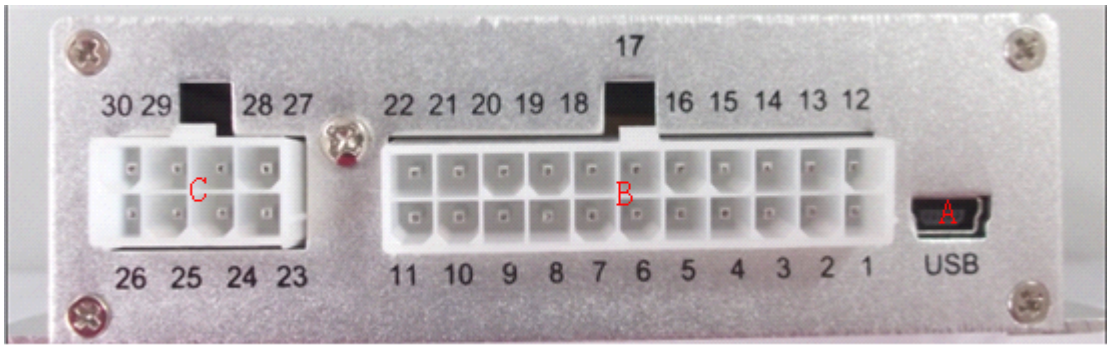
Driver fatigue alarm will lead to Beep one time.

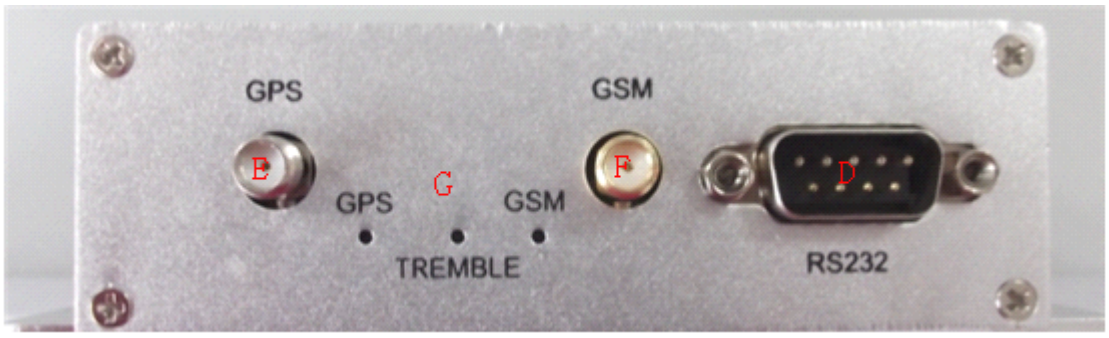
1.2 Specifications

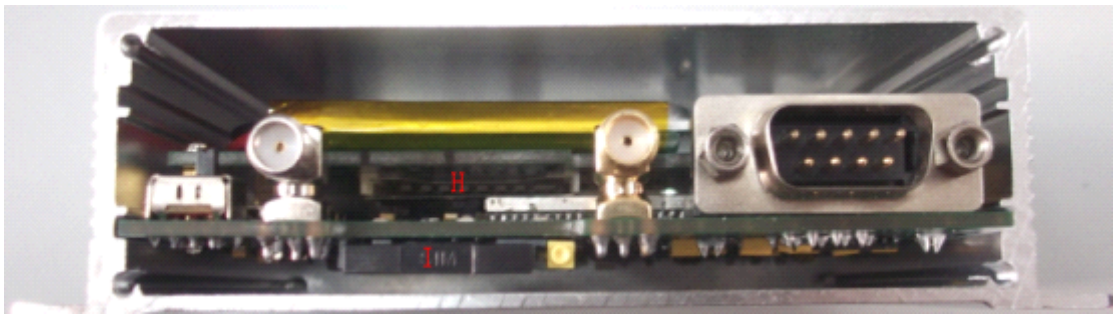
Feature	Characteristics
Dimension	100mm*90mm*30mm
N.W	260g
Exterior Power Supply	DC 12V – 24V
Inner lithium battery	DC 3.7V
Standby time	About 72 hours
Work time	About 12 hours
Exterior GSM antenna	Receive GSM signal better
Exterior GPS antenna	Receive GPS signal better
Operating Temperature Range	-20℃ to +60℃
Air pressure	860Kpa –1060Kpa

Humidity	**Up to 75% non-codensing**
Position accuracy	**10 –15 meters**
GSM chip	**support 3 frequency GSM 900/1800 /1900MHZ**
GPS chip	**Sirf-Star III (super-sensitivity and high accuracy)**
Hot start	**1 sec, average**
Warm start	**38 sec, average**
Cold start	**42 sec, average**
LED	**3 LEDs indicates GSM signal, GPS signal, power**
Button(not in the basic version)	**2 buttons, report location**
GPS Chipset	**SIRF StarIII**
GSM Module	**850/900/1800/1900 MHz**
Exterior Power Supply	**DC 12V – 24V**
Inner lithium battery	**DC 3.7V**
Air pressure	**860Kpa –1060Kpa**
Humidity	**Up to 75% non-codensing**
Position accuracy	**10 –15 meters**
GPRS Protocol	**TCP/UDP**
Position Accuracy	**10-15 meters**
Hot Start	**1 second**
Warm Start	**38 seconds**
Cold Start	**42 seconds**
Exterior GSM antenna	**Receive GSM signal better**
Exterior GPS antenna	**Receive GPS signal better**
LED light	**SD/GSM/GPS**
I/O Port	**2 switch input ports, 2 analog input ports, 2 digital input ports, 3 digital output ports, 2 serial input ports and 1 mini USB port**
Motion Sensor	**Build-in**
Flash Memory	**32Mb flash (save more than 10,000 points)**
Microphone/speaker	**High sensitivity**

1.3 Outside feature





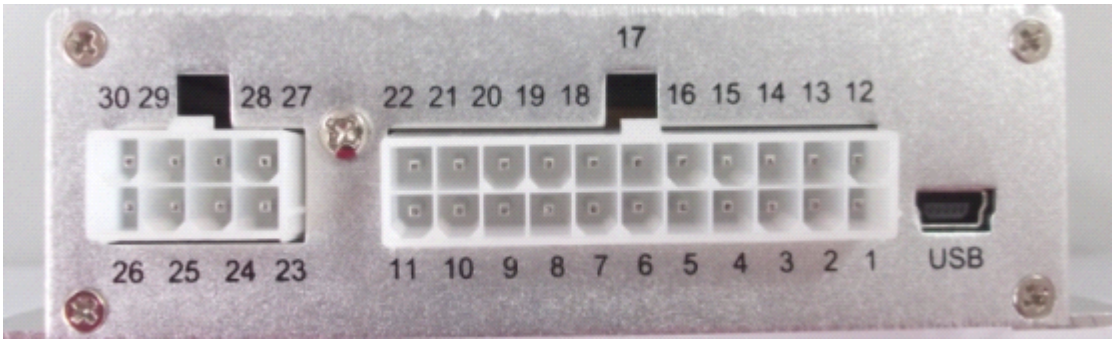


1.3.1 Socket and Switch

Hardware	Function
A. USB Port	Support "USB Converter" to update firmware
B. I/O Sockets	Expanding function, as below
C. Serial port 1(RS232-8PIN)	Connect to the RFID Reader
D. Serial port 2(RS232-DB9)	Connect to the Printer
E. GPS Antenna socket	Connect Exterior GPS Antenna
F. GSM Antenna socket	Connect Exterior GSM Antenna

G. Three LED	GSM LED(Right), SD Led, GPS Led
H SIM Card Holder	Hold a SIM card
I SD Card Holder	Hold a SD card

1.3.2 I/O ports



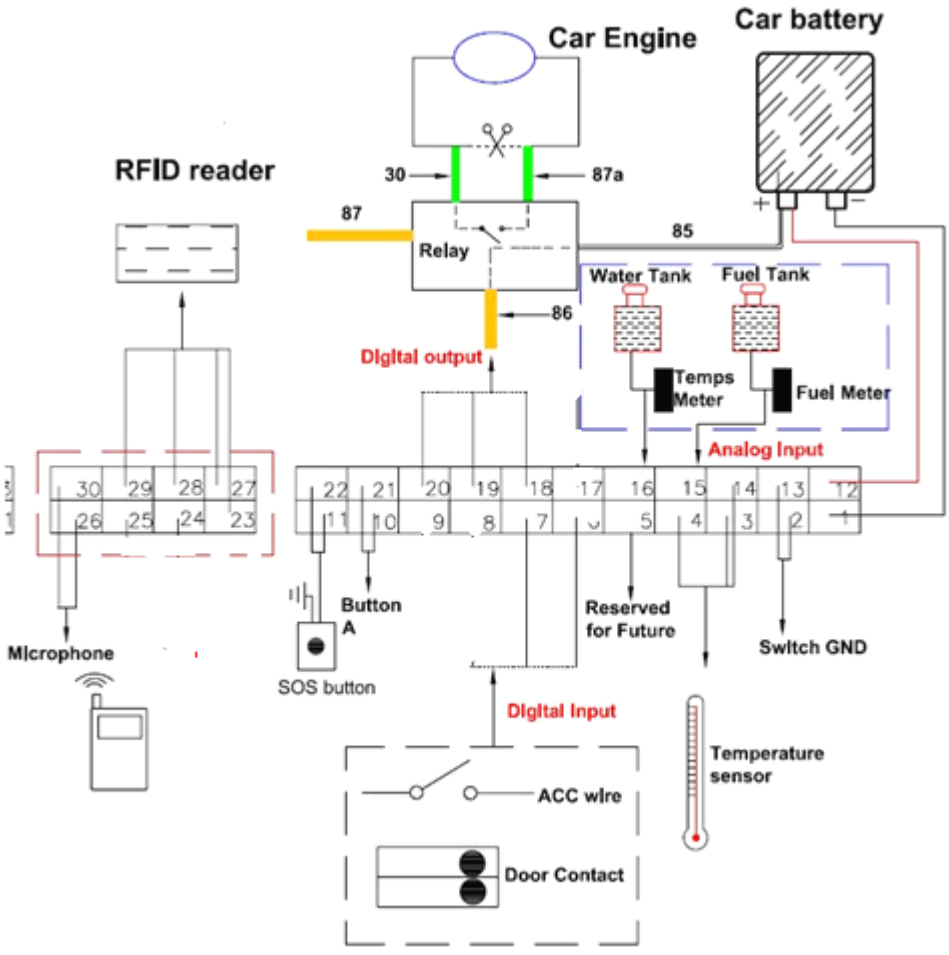
The function is as below:

NO.	Function
I/O 01	GND
I/O 02	Switch GND
I/O 03	VCC +5V
I/O 04	Connect to the temperature sensor
I/O 05	Output
I/O 06	Digital input 2 (Detection of the door)High-power frequency detection
I/O 07	Digital input 1 (Detection of ACC)High-power frequency detection
I/O 08	Button C（Reserve）
I/O 09	Button B（Reserve）
I/O 10	Button A
I/O 11	SOS button
I/O 12	VCC +12V
I/O 13	GND
I/O 14	GND
I/O 15	ADB
I/O 16	ADA
I/O 17	Reserve
I/O 18	Digital output 3
I/O 19	Digital output 2
I/O 20	Digital output 1
I/O 21	GND
I/O 22	GND
I/O 23	

I/O 27 I/O 28 I/O 29	**Serial input ports 1**
I/O 24 I/O 25	**Reserve**
I/O 26 I/O 30	**MIC-phone**

Note: The port that no mark is leaving to customize.

Ports Graphics



1.3.3 LED Indicators

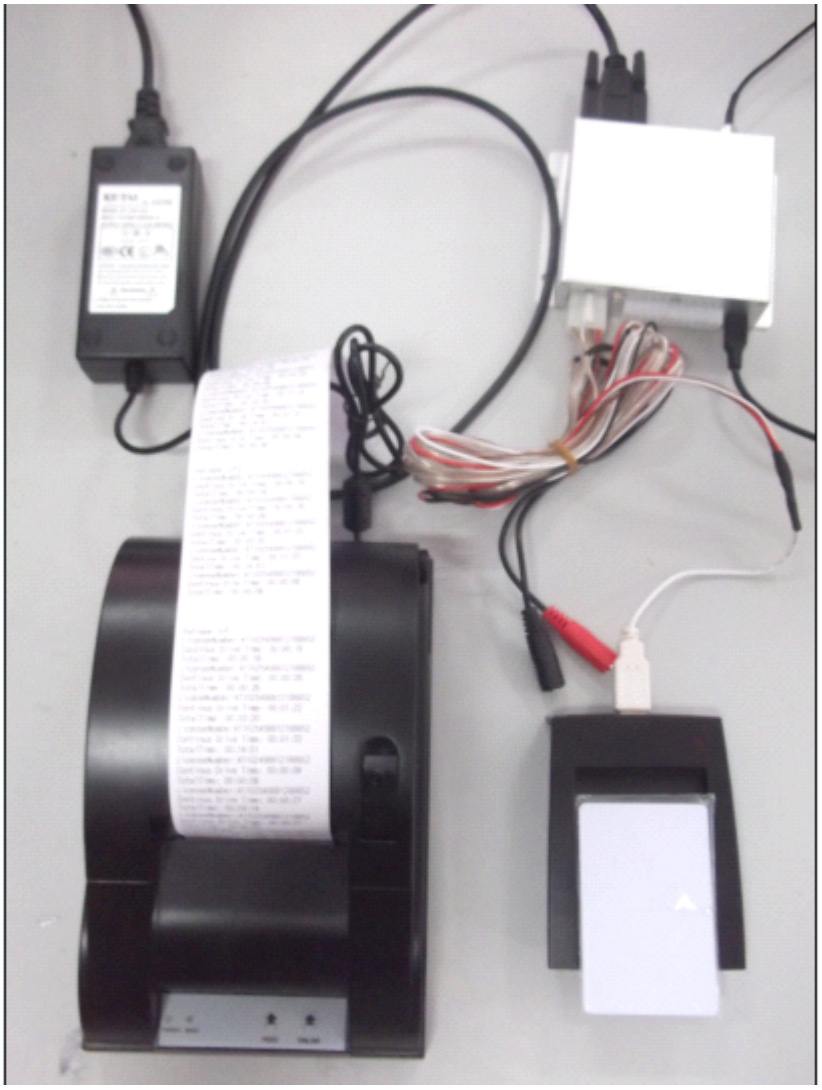
LED	State	Description

GPS Indicator (Blue LED)	light 0.1s dark 2.9s	GPS Signal Well
	light 1s dark 2s	No GPS Signal
	light 0.5s dark 0.5s	GPS Fault
SD (Red LED)	light 0.1s dark 0.1s	SD card Initial
	light 0.1s dark 2.9s	SD card work well
	light 1s dark 2s	SD card work Fault
GSM Indicator (Green LED)	light 0.1s dark 0.1s	System Initial
	light 0.1s dark 2.9s	GSM Signal Well
	light 1s dark 2s	No GSM Signal
	always dark	No SIM Card Or Bad SIM Card
	light 0.1s dark 0.1s (flash three times)	Call Ring
	always light	In A Call
	light 0.1s dark 0.3s (flash five times)	Send A SMS
	light 0.1s dark 0.3s (flash five times)	Receive A SMS
	light 0.1s dark 1s	Connect to GPRS

When VN is in work mode, if GSM signal is in good state, the green led will flash, similarly, if GPS signal is in good state, the blue led will flash, if the green led is not flashing, that indicates the GSM signal is not good, if the blue led is not flashing, then you should check if there is something upon the GPS antenna top,red led indicate the status of the SD card, if red led flashing is not normal, may be card broken, or no card, or poor contact, or the system does not support high-capacity SD card(Maximum of not more than 2G). Further, if you find the three LEDs are dark, maybe the VN entered into "sleep-mode".

1.3.4 Connect to the external peripheral

The VN06 have two Serial ports, they could connect to the RFID reader and Printer,can insert the SD card related operations.



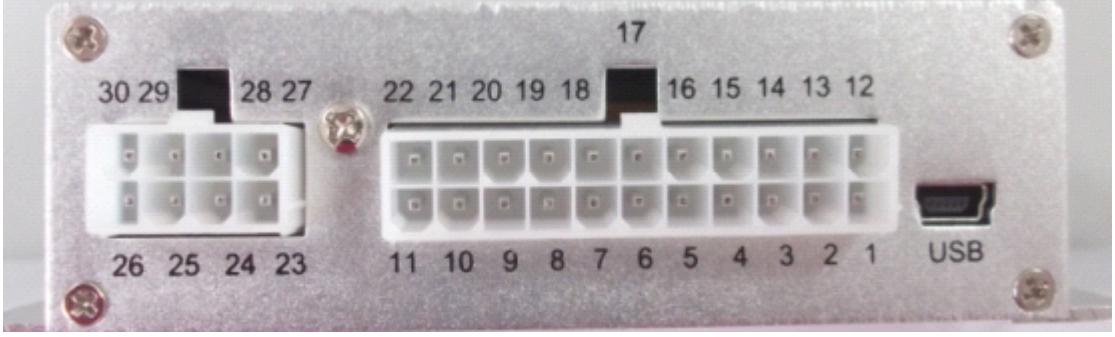
How to connect the peripheral equipment

1. Introduce of the serial input port

VN06 have two serial input ports,one is RS232-8PIN ,the other is RS232-DB9.

Serial input 1 (RS232-8PIN) connect the RFID card reader,

Serial input 2 (RS232-DB9) connect the Printer,



Serial input 1: (Pin 23,27,28,29)

Pin 23(Black)----------GND

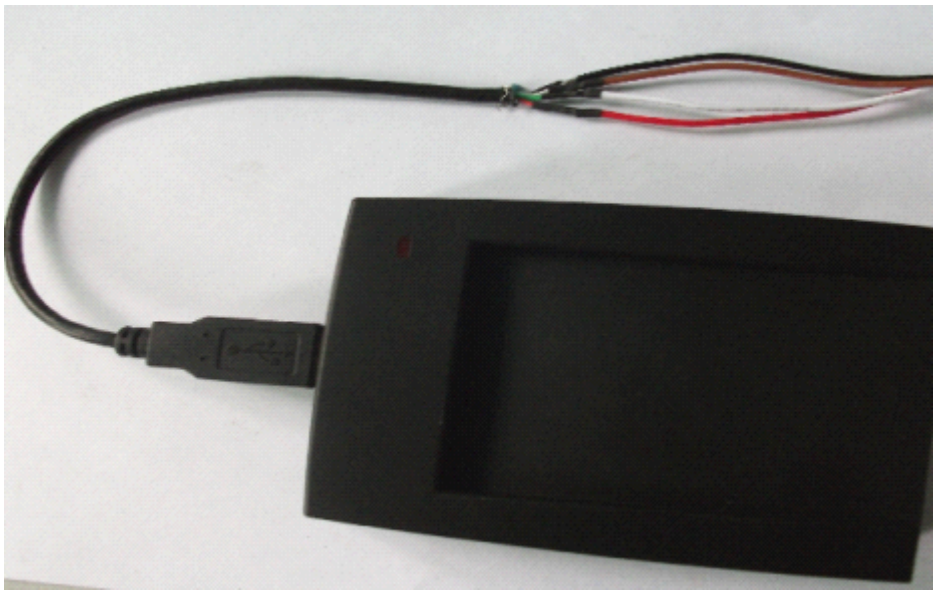
Pin 27(Red)----------ACC(5V)

Pin 28(Brown)----------TXD (send data)

Pin 29(White)----------RXD (receive data)

Serial input 2: (RS232-DB9)

2. How to connect the RFID card reader?



The Baud of the RFID card reader must be 9600. You can see the USB cable have four cables, Please find the every cable and connect each cable in the right way, just as the picture i show you. We define the serial port1 connect the RFID card reader.

The Black cable----------GND (connect the Pin23)

The Red cable----------VCC(5V) (connect the Pin27)

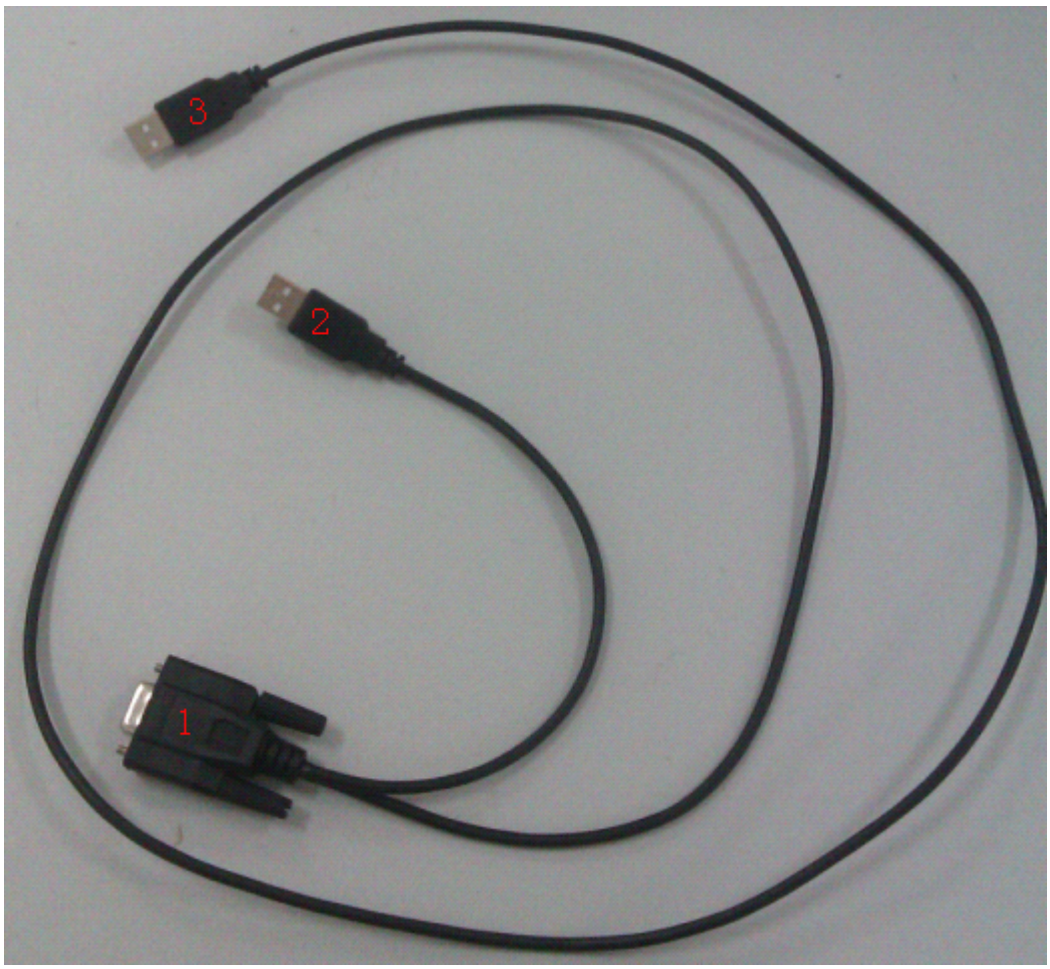
The Whit cable----------TXD (connect the Pin28)

The Green cable----------RXD (connect the Pin29)

To insert the SD card, Card reader Successful, SD card will record the reader information

Connection of RFID and computer serial port can write to the configuration of RFID

Need to configure the software (reserved function)



1.RS232-DB9 connected to the computer serial

2.Short USB cable, 5V power supply

3.Long USB cable, connect the RFID

3. How to connect the Printer

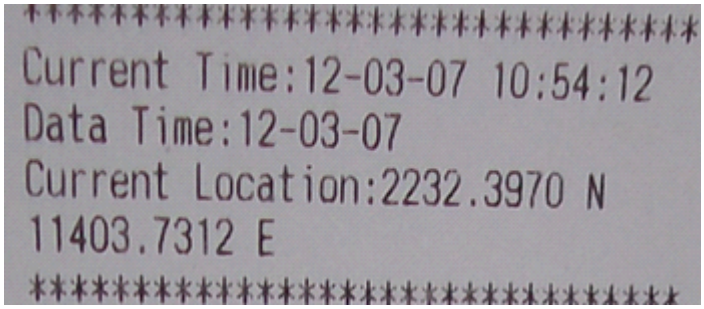
Machine RS232 DB9 male connect the printer RS232 DB9 female,

when you need print data, please Connect the printer to our machine before you power on the machine and printer

After you send the print command which is described in the command list, our machine will read the SD card and then send the data to printer to print it out

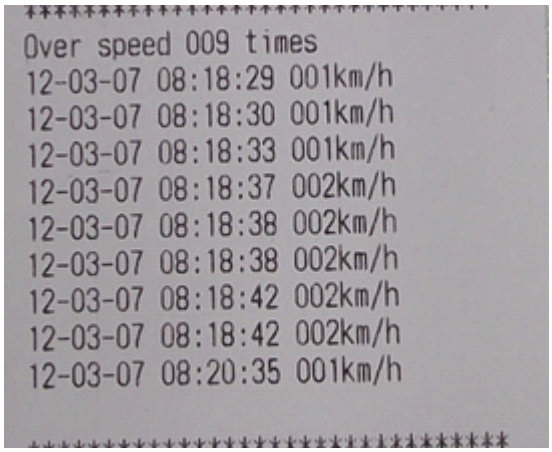
Print picture

A. Time and location section description:



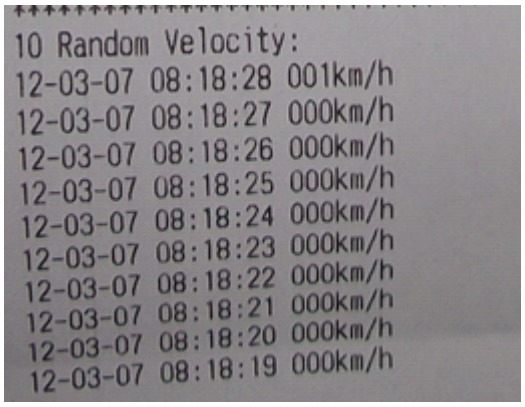
B. Fatigue info description

C. Over speed time:



D. Door close or open time:

E. Random Velocity:



F. Vietnam format print example:

4. The use of the SD card

Driving data not only can be recorded to SD Card, but also be printed out from printer.

Driver card for the first time after the success of debugging information recorded in the serial output card, and judge for drivers ready to start driving when the driver a second credit card, the system determines that the end of driving for drivers, the system information of the driver again record to the SD card, the accumulated driving time records to SD card and a single driving time and the day (Note: the latter information read from RFID Card must be same as the former information read by system)

Recording conditions:

1.VN06 single driving time and continue driving time and total time data will be write to file which name format follow as D+date.txt

2.VN06 on a single driving time a single drive for too long the alarm and the day driving long cumulative time alarm (To facilitate testing, the single driving time more than one minute, print a

single drive alarm information too long, more than two minutes, every second print time alarm information, the day driving the cumulative time over 3 minutes, print once the day driving the cumulative time alarm information over four minutes, every second print time alarm information).

3.VN06 will write latitude,longitude and time information into the the file which name format follow as D+date.txt when the vehicle speed is zero .

4.VN06 will record time,Latitude,Longitude and current door state to the file which name format follow as C+date.txt when the door state change.

5.VN06 will record Latitude,Longitude and time information to the file which name format follow as D+date.txt when the vechile speed is zero.

6.VN06 will record the over speed condition to the file which name format follow as O+date.txt.

7.VN06 record each second speed of vehicles to the file which name format follow as S+date.txt.

8.VN06 can print the data of the specified date which include:

(A) Fatigue Info

(B) Over the Speed the Info

(C) Door, Close and the Open the Info

(D) 10 the Random the Velocity1.3.5 Detect Car ON/OFF

Note:

1.Hold the card for one second in the active distance when the RFID Reader reading driver's card.

2.If you come across problems, please save the log in order to help our staff to locate it.The method of save log is save serial port debug terminal (USB PORT) output information of the machine.

3 Be sure that before you power on machine ,insert the SD card into the SD card slot machine.

4 card file naming format:

A) D + date. Txt: on behalf of the data log files.

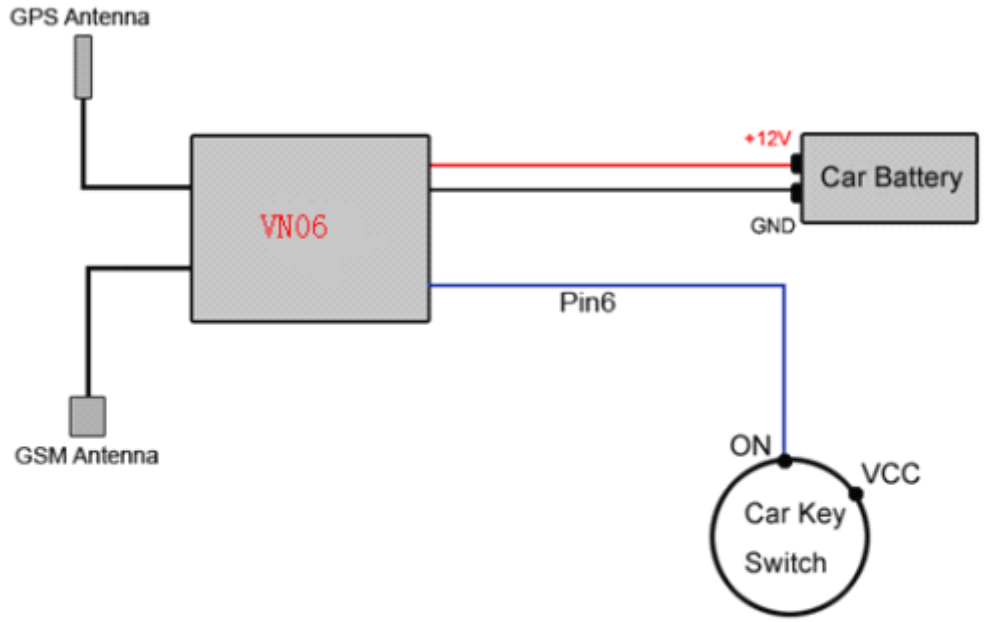
B) P + date. Txt: Fatigue information on log files.

C) C + date. Txt: record Keyless Entry information to be printed.

D) O + Date txt: record of speeding information to be printed.

E) E + date. Txt: error file.

F) S + date. Txt: Speed record.



Connect VN Pin6 to the Car Key Switch , to the ON point.

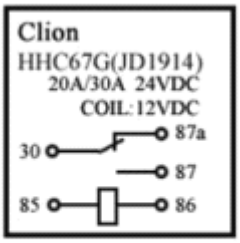
When Car Switch On, VN will send Alarm to Server, type is 52

When Car Switch Off, VN will send Alarm to Server, type is 53

When finish this connect, in every GPRS data will have the state of Engine

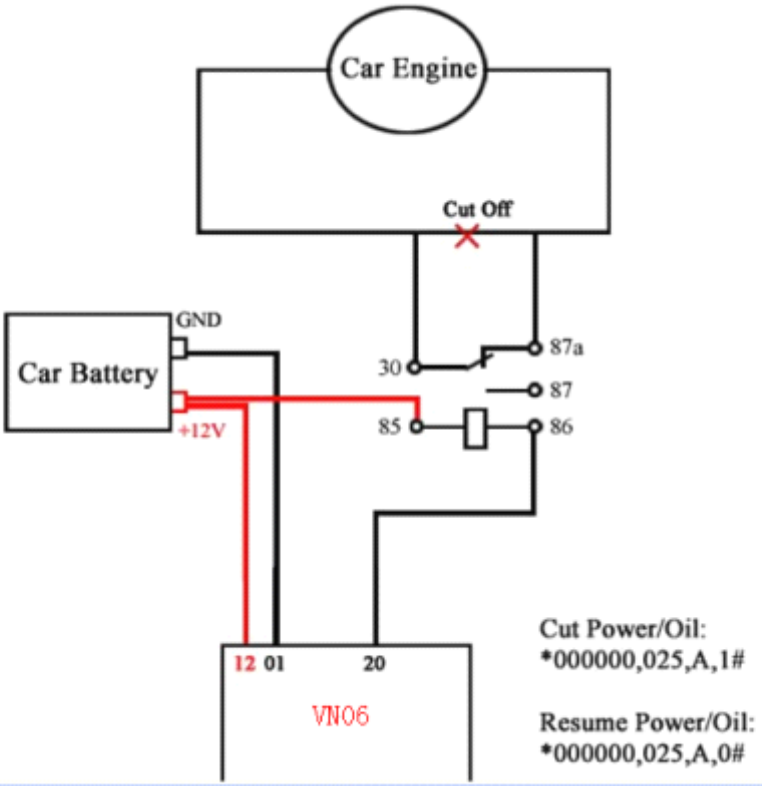
1.3.6 Connect Relay to control the Car Oil/Power (Port 20/19/18/17)

Diagram Of Relay

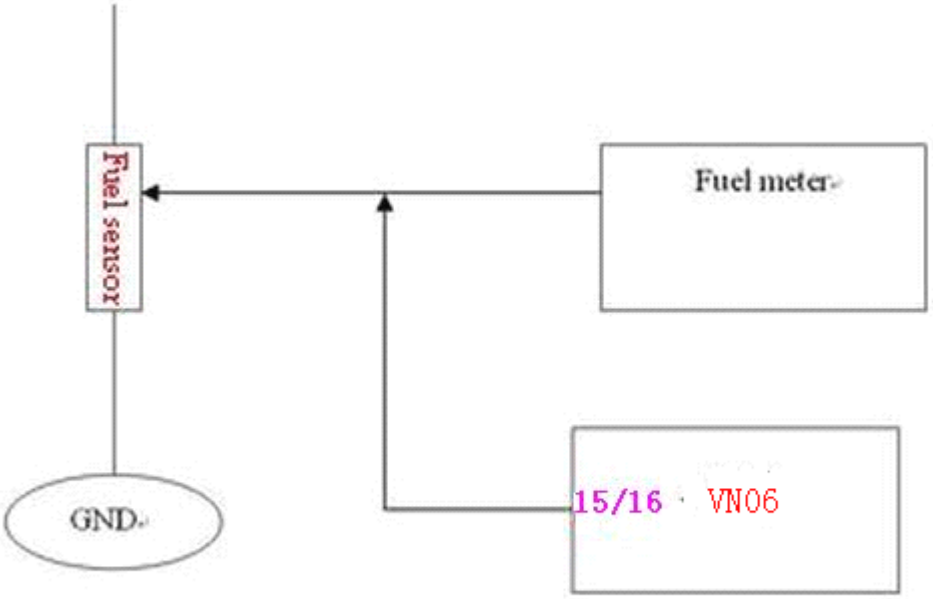


Step:
1.Connect AVL pin 12 to Car Battery +12V
2.Connect AVL pin 01 to GND
3.Cut off the circle of Car Engine
4.Relay port 30 and port 87a connect to Car Engine
5.Relay port 85 connect to Car Battery +12V power
6.Relay port 86 connect to AVL08 pin 20

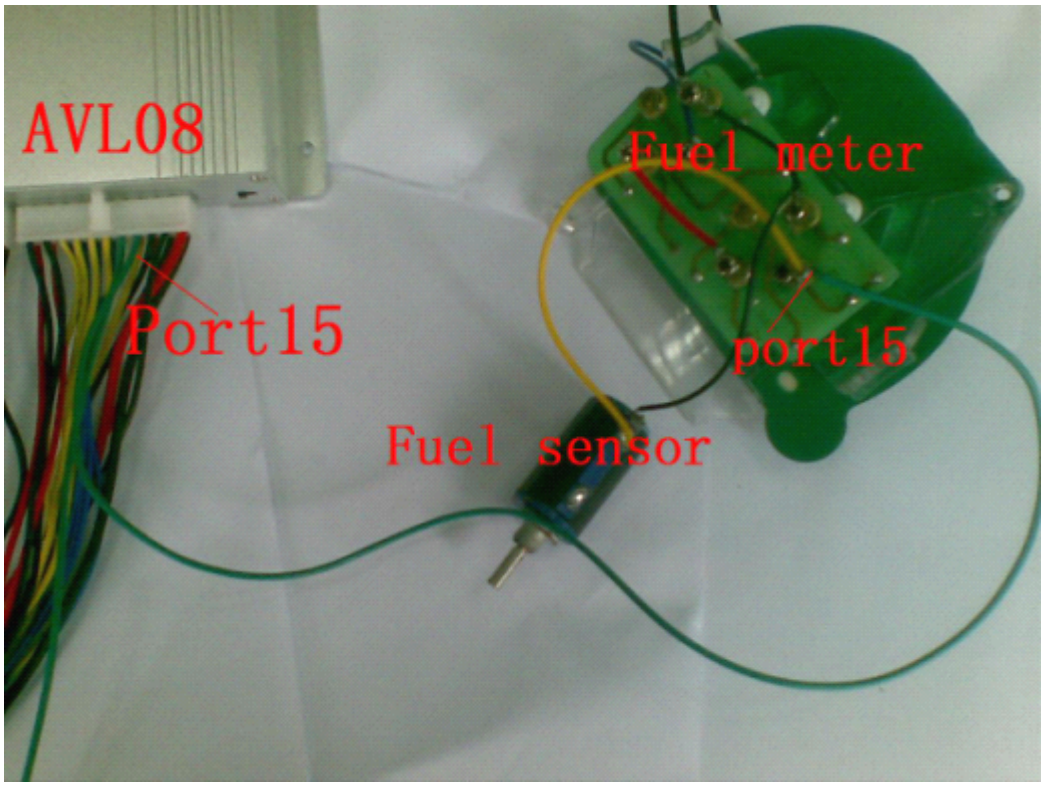
Diagram Of VN06



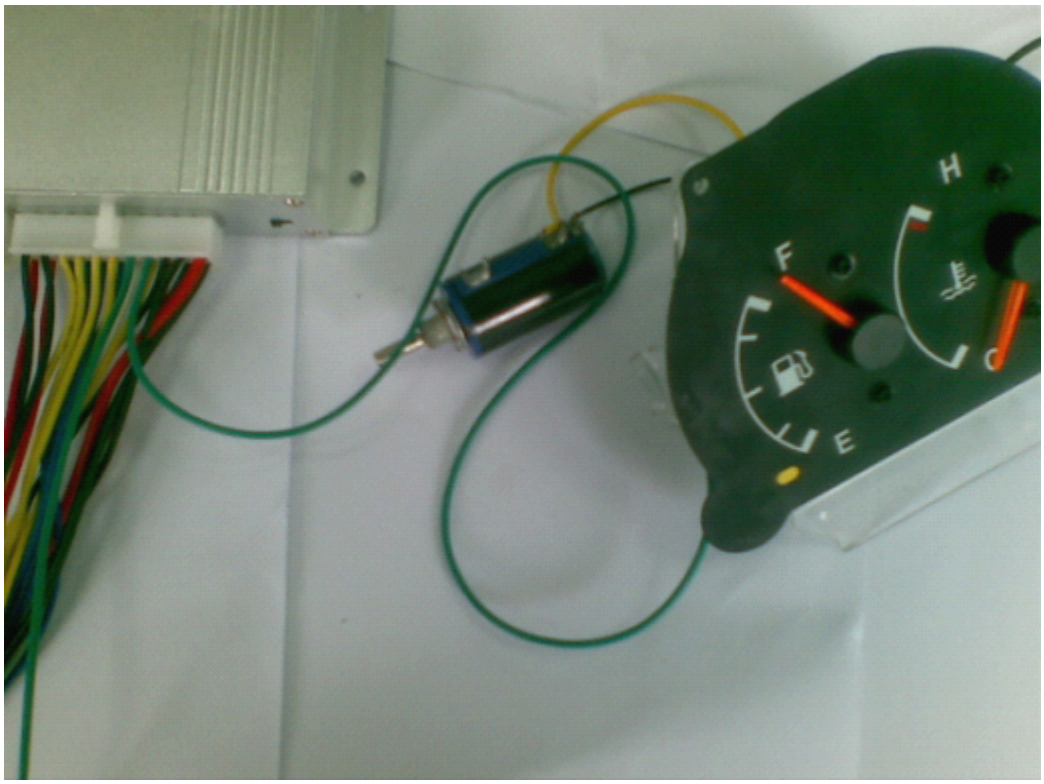
1.3.7 Connect to the fuel sensor to detect the fuel.(port 15/16)



Our VN can get the voltage by the AD collection and according to the voltage change to know the fuel level in the tank. because the fuel tank in different car is different .so you need to find out the different relation between the voltage and fuel .our VN can collect the voltage from 0-18V.so that mean if you want to know the fuel leave in the fuel tank, so you should work out the coordinate relation between voltage and fuel in your server. When the GPRS data come to the server, the server work out fuel level in the tank by analyze the GPRS data.



Picture 1 (how to connection)



Picture 2 (About the fuel meter)

2. How to use the Product

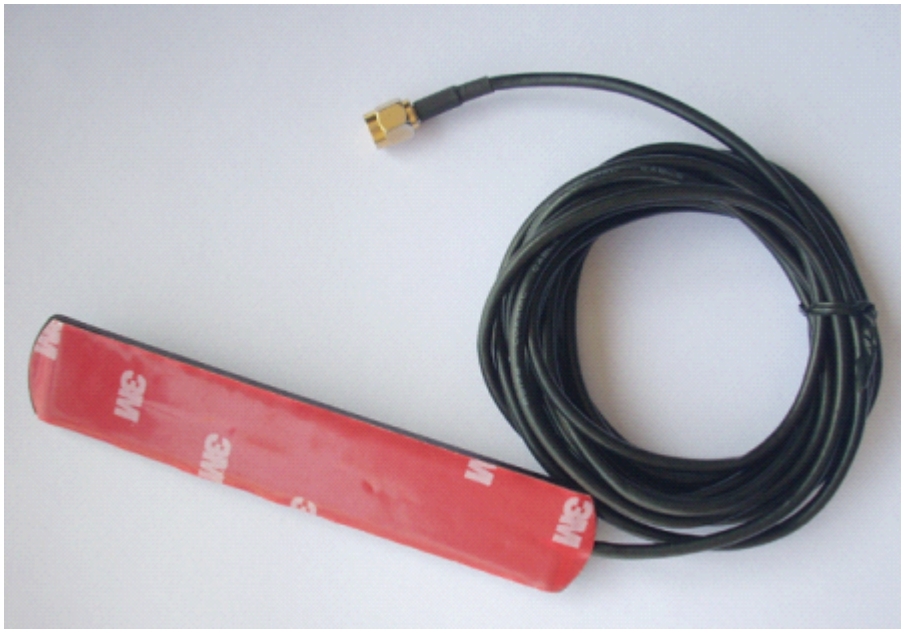
2.1 Prophase to prepare

Step1: Inset a SIM card.

Make sure the SIM card can communicate with other cards via SMS and call, and before installing the SIM card to the holder, please use a mobile phone to empty the SMS storage of the card

Step2: Connect GSM Antenna and GPS Antenna to VN unit.

(GPS antenna)



(GSM antenna)

When you connect to the GSM and GPS antenna,pls make sure that it is until the connection is very firm.

Step 3: Fix the VN connect to the exterior power by 12V.

Please refer to introduce about I/O ports, port1 and port 12 apart connect to the exterior power of anode and cathode.

Step 4: Turn on the VN, observe the three LEDs in the VN

Turn on the AVL, you will see the three LEDs flash at the same time.

It entered into initial mode.

After about 1 mins, the device will work normal, then you could look the LEDs of status and refer to introduce about 1.3.3 led indicators.

When VN is in work mode, if GSM signal is in good state, the green led will flash, similarly, if GPS signal is in good state, the blue led will flash, if the green led is not flashing, that indicates the GSM signal is not good, if the blue led is not flashing, then you should check if there is something upon the GPS antenna top. Further, if you find the three LEDs are dark, maybe the VN entered into "sleep-mode" or there is no power in the VN unit.

Notes: As everyone knows, the GPS signal is very weak or have no GPS signal in the office .So pls put the VN06 to the open air in order to receive the great GPS signal.

2.2 Use the command to set device by SMS

Notes: $$$$$$ is the password, and the default is:000000

If you want to modify the password :

The command of format:

***$$$$$$,001,@@@@@@#**

Explication: $$$$$$: the old password

@@@@@@: the new password

For example: *000000,001,123456#

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'001'OK

***000000,001,123456#**

2.2.1 Use the GPRS function

Notes: At first of all, make sure the SIM card insert to the device and have the GPRS function.

Step1: Set the APN (Access Point Name)

Different network of provider have the different APN at every country, if you don't know, pls refer to the attachment.

Format: *$$$$$$,011,APN,Username,Password#

Notes: The username and password could to be null1.

For example: *000000,011,cmnet,,#

Explication: The China Mobile's APN is "cmnet", and the username and password are empty.

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'011'OK

***000000,011,cmnet,,#**

Step2: Set the server's IP & PORT

Format: *$$$$$$,015,0,IP,PORT#

For example: *000000,015,0,72.167.29.18,3308#

72.167.29.18 is our server's IP address,3308 is the port.

If client have the server by himself, pls make sure the IP and port is correct.

After you send the command of SMS to device, it will reply to your mobile phone:

Receive:'015'OK

***000000,015,0,72.167.29.18,3308#**

Step3: Set Time Interval GPRS

Format: *$$$$$$,018,X,Y#

X: the time interval (unit is sec),Y: the times of the data have to send by GPRS.

For example:*000000,018,60,999#

The device will send GPRS every 1 mins and no times limit.

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'018'OK

***000000,018,60,999#**

Step4: Open the GPRS function

Format: *$$$$$$,016,X#

X: close/open the GPRS function,

For example: *000000,016,1#

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'016'OK

***000000,016,1#**

2.2.2 Set the sleep mode

Step1: open the sleep mode and the tremble sensor

Format: *$$$$$$,021,XY#

X: close/open the sleep mode

Y: close/open the tremble sensor

For example: *000000,021,11#

When you want to use the sleep mode of function, make sure open the sleep mode and tremble sensor

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'021'OK

***000000,021,11#**

Step2: set the time of no tremble into the sleep.

Format: *$$$$$$,044,X#

X: After the tremble sensor don't tremble for X second, tracker will into sleep mode(unit：sec)

For example：*000000,044,60#

If the device have not tremble for 60 sec, the device will into the sleep mode.

After you send the command of SMS to device, it will reply to your mobile phone: Receive:'044'OK

***000000,044,60#**

Step 3: set the time of tremble to wake up the device

Format: *$$$$$$,043,X#

X: After the tremble sensor continuance vibration for X second, device will wake up.

For example: *000000,043,30#

If the tremble sensor continuance vibration for 30 sec, device will wake up.

After you send the command of SMS to device, it will reply to your mobile

phone: Receive:'043'OK

***000000,043,30#**

2.2.3 Set the interval SMS

Step1: Set the SOS number

Format: *$$$$$$,003,0,F,CallNumber,SMS Number#

When the device send to SMS to mobile phone by interval, should to set a SOS number which the number of the mobile phone to receive the data.

For example: *000000,003,0,1,008613800755500, 008613800755500##

When set the SOS number, pls append the 00 and international number as the example.86 is the international number for china.

After you send the command of SMS to device, it will reply to your mobile phone:

Receive:'003'OK

***000000,003,0,1,008613800755500, 008613800755500#**

Step2: Set the interval time for SMS.

Format: *$$$$$$,002,X,Y#

X: Time interval (unit:mins)

Y: the times of the data have to send by SMS

For example:*000000,002,1,999#

The device will send SMS every 1 mins and no times limit.

After you send the command of SMS to device, it will reply to your mobile phone:

Receive:'002'OK

***000000,002,1,999#**

2.2.4 Other useful commands

- **Get current location:**
  ***$$$$$$,000#**

- **Get the IMEI from the device:**
  ***$$$$$$,801#**

- **Reboot the device by SMS:**
  ***$$$$$$,991#**

- **Initialization the device**
  ***$$$$$$,990,099#**

3 The format of the GPRS

The GPRS command server sent to device must be 8-bit ASCII format. The GPRS command must be same as sms command in this user guide.

The data of the device send to the server:

Format：$$(2 Bytes) + Len(2 Bytes) + IMEI(15 Bytes) + | + AlarmType(2 Bytes) + GPRMC + | + PDOP + | + HDOP + | + VDOP + | + Status(12 Bytes) + | + RTC(14 Bytes) + | + Voltage(8 Bytes) + | + ADC(8 Bytes) + | + LACCI(8 Bytes) + | + Temperature(4 Bytes) | + Mile-meter(14 Bytes)+ | Serial(4 Bytes) + | + Checksum (4 Byte) + \r\n(2 Bytes)

The format of ASCII:

$$B0353358019462410|AA$GPRMC,102156.000,A,2232.4690,N,11403.6847,E,0.00,,180909,,*15|02.0|01.2|01.6|000000001010|20090918102156|14181353|00000000|279311AA|0000|0.7614|0080|D2B5

Code	Explanation
$$	2Bytes, indicates header of command from tracker unit to call centre, in ASCII code (hex is 0x24).
Len	2Bytes, indicates length of all command, including header and end (the array is

	first high to low).
IMEI	15Bytes, at most 20 bytes.
Alarm type	2Bytes, the GPRS data trigger type.
DATA	GPRMC string
	PDOP
	HDOP
	VDOP
	Status (12bytes)
	RTC (14bytes)
	Voltage(8bytes)
ADC	8bytes,the ADC value.
LACCI	Location information elements
Temperature	Temperature information
Milemeter	Mileage data
Serial ID	4bytes, sign every GPRS data, the range is [0001-9999], then circle it again from 0001 to 9999.
Checksum	4Bytes, means CRC check of all the data ahead, CRC-16 modbus (Polynomial = 0xA001， initialize data is 0xffff) checksum, not including its own byte and end characters. For example: $$B0353358019462410\|AA$GPRMC,102156.000,A,2232.4690,N,11403.6847,E,0.00,,180909,,*15\|02.0\|01.2\|01.6\|000000001010\|20090918102156\|14181353\|00000000\|279311AA\|0000\|0.7614\|0080\|D2B5 D2B5= CRC-16 modbus ($$B0353358019462410|AA$GPRMC,102156.000,A,2232.4690,N,11403.6847,E,0.00,,180909,,*15|02.0|01.2|01.6|000000001010|20090918102156|14181353|00000000|279311AA|0000|0.7614|0080|).
\r\n	2Bytes, end char (hex format is 0x0d,0x0a).

- Alarm type
  - 0x01 SOS button is pressed
  - 0x49 Button A is pressed
  - 0x09 Auto Shutdown Alarm
  - 0x10 Low battery Alarm
  - 0x11 Over Speed Alarm
  - 0x13 Recover From Over Speed
  - 0x14 Deceleration Alarm
  - 0x15 Acceleration Alarm

- 0x30 Parking Alarm
- 0x42 Out Geo-fence Alarm
- 0x43 Into Geo-fence Alarm
- 0x50 IO-1 Close —digital input 1 closed
- 0x51 IO-1 Open —digital input 1 opened
- 0x52 IO-2 Close —digital input 2 closed
- 0x53 IO-2 Open —digital input 2 opened
- 0x60 Begin Charge
- 0x61 End Charge
- 0x77 Angle Alarm
- 0x88 Heartbeat
- 0x91 Into Sleep Mode
- 0x92 Wakeup From Sleep Mode
- 0xAA Interval GPRS data

- Status(12 Bytes) —— Status：
  - Byte 01 —— SOS button
  - Byte 02 —— Button A button
  - Byte 03 —— Reserved
  - Byte 04 —— Reserved
  - Byte 05 ——digital Input 1 the status of the digital input 1 PORT7(connect to the engine, Positive Input 1)
  - Byte 06 ——digital Input 2 the status of the digital input 2 PORT6 (connect to the door, Positive Input 2)
  - Byte 07 ——Reserved
  - Byte 08 ——Reserved
  - Byte 09 ——Digital Out 1
  - Byte 10 ——Digital Out 2
  - Byte 11 ——Digital Out 3
  - Byte 12 ——Reserved
  - Voltage(8 Bytes) ——Value of the voltage：
    - Format：ABBBIIII
    - A —— Charge Status (0 = Off Charge , 1 = On Charge)
    - BBB —— Battery Voltage (For example, 367 mean 3.67V)
    - IIII —— Input Charge Voltage (For example, 1251 mean 12.51V)
- ADC(8 Bytes) —— AD collection：
  - Format：CCCCDDDD
  - CCCC —— ADA collect (For example, 1251 mean 12.51V)
  - DDDD —— ADB collect (For example, 1251 mean 12.51V)
- LACCI(8 Bytes) —— Location information elements：
  - Format：LLLLCCCC
  - LLLL —— Location area code

  - CCCC —— Cell ID
- Temperature(4 Bytes) —— Temperature（reserve for the device has no temperature sensor）:
  - Format：STTT
  - Precision is 0.1℃
  - The first byte “S” mean sign， such as “0/1/-”
  - Eg：0345 mean +34.5℃，1234 mean +123.4℃，-123 mean -12.3℃
- Mile-meter(14 Bytes) —— Location information elements：
  - Format is AAAA.BBBBKm.
  - Four bytes after the radix point.
- Serial(4 Bytes) —— Serial number：
  - Format：SSSS
  - Every time reboot the device or reset,the serial number will initialize to 0001.
  - Every GPRS message send out will add one
  - After the serial number to 9999, restart from 0001 again

This is the AVL05 GPRS data short format communication protocol.

Code	Explanation
$$	2Bytes, indicates header of command from tracker unit to call centre, in ASCII code (hex is 0x24).
IMEI	5Bytes
Alarm type	2Bytes, the GPRS data trigger type.
GPRMC	33Bytes
Milemeter	Mileage data ,5Bytes
\r\n	2Bytes, end char (hex format is 0x0d,0x0a).

Format： $$(2 Bytes) + IMEI(5 Bytes) ＋Alarm Type(2 Bytes) + GPRMC(33 Bytes) + \r\n(2 Bytes)

$$07311AAA2232.3502N11403.8126E0.00*95.13

- Alarm type
  - 0x01 SOS button is pressed
  - 0x49 Button A is pressed
  - 0x09 Auto Shutdown Alarm
  - 0x10 Low battery Alarm
  - 0x11 Over Speed Alarm
  - 0x13 Recover From Over Speed

- 0x14 Forward acceleration alarm
- 0x15 Reverse acceleration alarm
- 0x30 Parking Alarm
- 0x42 Out Geo-fence Alarm
- 0x43 Into Geo-fence Alarm
- 0x50 IO-1 Close
- 0x51 IO-1 Open
- 0x52 IO-2 Close
- 0x53 IO-2 Open
- 0x60 Begin Charge
- 0x61 End Charge
- 0x77 Angle Alarm
- 0x88 Heartbeat
- 0x91 Into Sleep Mode
- 0x92 Wakeup From Sleep Mode
- 0xAA Interval GPRS data

- Mile-meter(5 Bytes) —— Location information elements：
  - Format is AA.BBKm.
  - Two bytes after the radix point.

The link of the explain about the CRC-16(modbus):

http://www.lammertbies.nl/comm/info/crc-calculation.html

4. SMS instruction list.

If you want to know more about the VN, and design your special VN, you can refer to the SMS instruction list.
$$$$$$ is user`s password, and initial password is 000000

	SMS Instruction	Format	Note
1	Request one position	*$$$$$$,000#	
2	Modify user password	*$$$$$$,001,@@@@@@#	$$$$$$ is old password @@@@@@ is new Password

3	Set the time intervals of position notice SMS The Position SMS will send to the preset SOS number.	*$$$$$$,002,X,Y#	X (Max 3 Digital) =0, Stop send position SMS =[1,60000] Time interval (Unit: mins) Y (Max 3 Digital) =[1,999） times send SMS Y=0, Disable this funiction Y=999, continue send SMS
4	Set a preset phone & SMS number for SOS button	*$$$$$$,003,0,F,CallNumber, SMS Number#	F = 0, Disable this function =1, Only send an alarm SMS to the preset SMS Number Notice :Tel Number and SMS Number (must <25 digits)
5	Set low power alarm When the AVL voltage is lower than the preset value, AVL will send one lower power alarm GPRS data to the Preset Server.	*$$$$$$,004,XXX,YYY#	XXX is the low power alarm voltage,eg: 3.8v,XXX=380 YYY is the auto shut down voltage,eg: 3.5v,YYY=350 For example： *$$$$$$,004,380,350#
6	Set over speed alarm When the AVL speed higher than the preset value, AVL will send one over speed alarm GPRS data to the Preset Server.	*$$$$$$,005,S,X,Y,Z#	S=1 Enable speed alarm, S=0 Disable speed alarm. X=[10<XXX<250] (The speed preset value) unit is km/h Y is the times over speed [1,999] unit is second Z=[10,360],(The timeinterval to send speed alarm) unit is second.
7	Set Geo-fence alarm When the AVL move out preset scope, AVL will send one Geo-fence GPRS data to the Preset Server.	*$$$$$$,006,+lat1,+long1,+lat2,+long2,X,Y#	Lat=[-9000.0000,+9000.0000] Long=[-18000.0000,+18000.0000] X=[10,360] is for time interval send alarm message. Y=0, Disable GEO-fence alarm. Y=1, Into GEO-fence alarm. Y=2, Out of GEO-fence alarm. Note:Long1>long2&lat1>lat2 Make sure the position of north latitude and east longtitude set it (+),otherwise set it (-)

			Format:+AAAAA.BBBB Make sure set the two position have the same digit after comma.
8	Extend setting	*$$$$$$,008,ABCDEFG#	A=0, Disable position report function which get position SMS by Calling A=1, Enable position report function which get position SMS by Calling B=0, Send the SMS in Text format. B=1, Send the SMS in NMEA format. C=0, AVL hung up after 4~5 rings when call incoming C=1, AVL do NOT hung up when one call incoming D=0 Machine normally send all SMS D=1 The machine will not send all SMS E=0, ADB Normal AD collect E=1, ADB Oil collect.(The average of two minutes to collect) F=0, ADA Normal AD collect F=1, ADA Oil collect.(The average of two minutes to collect) The difference of two method is: Normal AD collect will output the AD value currently AD collect percent will output the value of fuel percent. G=0
9	Change buad	*$$$$$$,009,S#	S=0, work in 900/1800 S=1, work in 850/1900 S=2, Automatic selection *note: the default of parameter is S=2, Automatically select the frequency band, if the unit of GSM module support three

			frequency(900/1800/1900), then you could set the parameter to S=0, if the unit of GSM module support the four frequency(850/900/1800/1900),then you could set the parameter to S=1.
10	Set APN,Username,Password	*$$$$$$,011,APN,Username,Password#	APN : APN string (must < 28 chars) User name: Your username (must < 28 chars) Password: Your password (must < 28 chars) * If haven't username or password, then left it blank. For example: *000000,011,CMNET,,## (It haven't username and password)
11	Set DNS	*$$$$$$,014, X,DNS1,DNS2# Disable the DNS	X=0 Disable the DN X=1 Enable the DNS DNS is the domain name server , xxx.xxx.xxx.xxx
12	Set IP Address Or Domain & port number	*$$$$$$,015,X,IP/DN,PORT#	X=0 use IP connect the server X=1 use DN connect the server IP : xxx.xxx.xxx.xxx DN:(domain name) www.xxx.com PORT : [1,65535]
13	Set the time intervals of GPRS Data	*$$$$$$,018,X,Y#	X (3 Digital) =0 stop send time interval GPRS =[10,999] Time interval (Unit: sec) Y (3 Digital) =0, stop send time interval GPRS = [1,999] After send YYY times stop. =999, continue send GPRS un-stop
14	Enable/Disable GPRS function	*$$$$$$,016,X#	X=0 Disable GPRS Function X=1 Enable GPRS Function This is the last step of GPRS

			setting.
15	Set the GPRS mode	*$$$$$$,019,X#	X=0, Use the UDP mode X=1, Use the TCP mode
16	Tremble sensor switch	*$$$$$$,021,XY#	X = 0 Disable Sleep mode X = 1 Enable Sleep mode Y = 0 Disable the tremble sensor Y = 1 Enable the tremble sensor
17	Set the Module	*$$$$$$,022,X,Y#	X=0, Close the GPS module when into sleep X=1, Open the GPS module when into sleep. Y=0, Close the GSM module when into sleep Y=1, Open the GSM module when into sleep
18	Enable/Disable I/O port	*$$$$$$,025,X,Y#	X=A, port 20 X=B, port 19 X=C, port 18 Y=0,Out port is low (the circuit will restore) Y=1,Out port is high (the circuit will be cut off) eg: *000000,025,A,1# Circuit to port 5 will be cut off
19	Heart Beat Switch	*$$$$$$,040,X#	X=0 Disable the heart beat function X=1 Enable the heart beat function
20	Heart Beat Intervals	*$$$$$$,041,X#	X is the heart beat interval, unit is minute [1<X<9999] X=0, Disable this funiction.
21	Heart Beat Init	*$$$$$$,042,0#	When receive this command, the heart beat will re-count time
22	Into sleep mode when without tremble for preset time	*$$$$$$,044,X#	After the tremble sensor don't tremble for X second, tracker will into sleep mode 30< X <65536 (Unit : second) For Example, configure AVL05 into sleep mode after no tremble for 30 second: *000000,044,30#

23	Wake up from Tremble	*$$$$$$,043,X#	After the tremble sensor continuous tremble for X second, tracker will wake up X=[1,255) (Unit : second) AVL05 Wake up from sleep mode after tremble for 10 second: *000000,043,10#
24	Parking alarm	*$$$$$$,110,X#	X=1 Enable Tremble alarm function, then if the AVL05 is Trembling for 5s continually, it will alarm(0x30), X=0 Disable Tremble alarm function
25	Reading the IMEI number	*$$$$$$,801#	This command to ask AVL reply the IMEI number the firmware of version.
26	Initialization Tracker	*$$$$$$,990,099#	It will set all parameter to factory default value (Excluding the Password).
27	Reboot by SMS command	*$$$$$$,991#	It will reboot the AVL05 by this SMS command.
28	Set Oil sensor	*$$$$$$,113,A,B#	A,B=[0,2000], the real voltage is [0,20V]. A is the empty fuel of corresponding voltage, B is the full fuel of corresponding voltage. *note: Every different types of car have different corresponding relation. Pls test it by yourself ,then set the command. Eg: *000000,113,100,500# Explain: it means empty fuel of corresponding voltage is 1V,and the he full fuel of corresponding voltage is 5V,if the AVL detect the voltage is 4V,then the value of fuel percent is (4-1)/(5-1)=75%.
29	Set OutA Change	*$$$$$$,117,A,B,C,D#	A=[0,999]km/h , the thresold of speed. B=[0,60000] ms,, the interval of

			outA off C=[0,60000] ms,, the interval of OutA on D=[0,99], the times of OutA change If the speed is lower than, the OutA will off B seconds, then restore C seconds, repeat it D times. *note： because of the safety, you had better set the parameter like this: *000000,117,60,500,3000,5#
30	OutA Change switch	*$$$$$$,116,A#	A=1, active 117 command set . A=0, Don`t active 117 command set
31	Map Link	*$$$$$$,100#	the device wil reply a sms link .after clicking the sms link, you will get a segment of google map for the device location on your cell phone
32	Set Call A	*$$$$$$,103,S,No#	This command set the function for Button A. S=0, If the button trigger, send out one GPRS. S=1,If the button trigger, it will call the number. For example: *000000,103,0,1234#, press button A, it send out GPRS (alarm type 49) *000000,103,1,1234#, press button A, it will call the 1234#.
33	Extend Setting	*$$$$$$,118,ABCDEFGH#	A=0, Disable send the interval GPRS data normally when trembles (Default) A=1, Enable send the interval GPRS data normally when trembles
			B=0, Disable send the interval GPRS data normally when Input 4(Port 6) close(Default) B=1, Enable send the interval GPRS data normally when

			Input 4 (Port 6) close
			C=0, Disable send the interval GPRS data normally when Input 3(Port 6) close(Default) C=1, Enable send the interval GPRS data normally when Input 3 (Port 6) close
			D=E=F=G=0, reserved
			H=0, Long GPRS H=1, Short GPRS
34	Set PIN	*$$$$$$,122,S,PIN#	S=1, Active this function. S=0, Disable this function PIN is the pin code of the SIM card, If the pin code is not correct, the SIM card will be locked, device can`t work normal.
35	Reboot time	*$$$$$$,600,X,Y#	X=0,Disable this function (Default) X=1, Active this function. Y= [10,9999]/ Minutes, Reboot time interval
36	Angle Alarm	*$$$$$$,400,X,Y#	X=0, Disable this function (Default) X=1, Active this function. X=2, Input 4 (Port 15) is high-frequency alarm when the open angle X=3, Input 3 (Port 13) is high-frequency alarm when the open angle Y= [1,360] Angle range
37	GPRS data transmission in the form	*$$$$$$,119,X#	X=0，only GPRS data X=1， only SMS data, all gprs data will change to sms data also
38	Clear data flash	*$$$$$$,500#	Clear stored in the flash memory inside the machine
39	Acceleration and deceleration alarm	*$$$$$$,120,A,B,C#	A=0 Disable this function (Default) A=1 Active this function. B= [0,2000] Acceleration

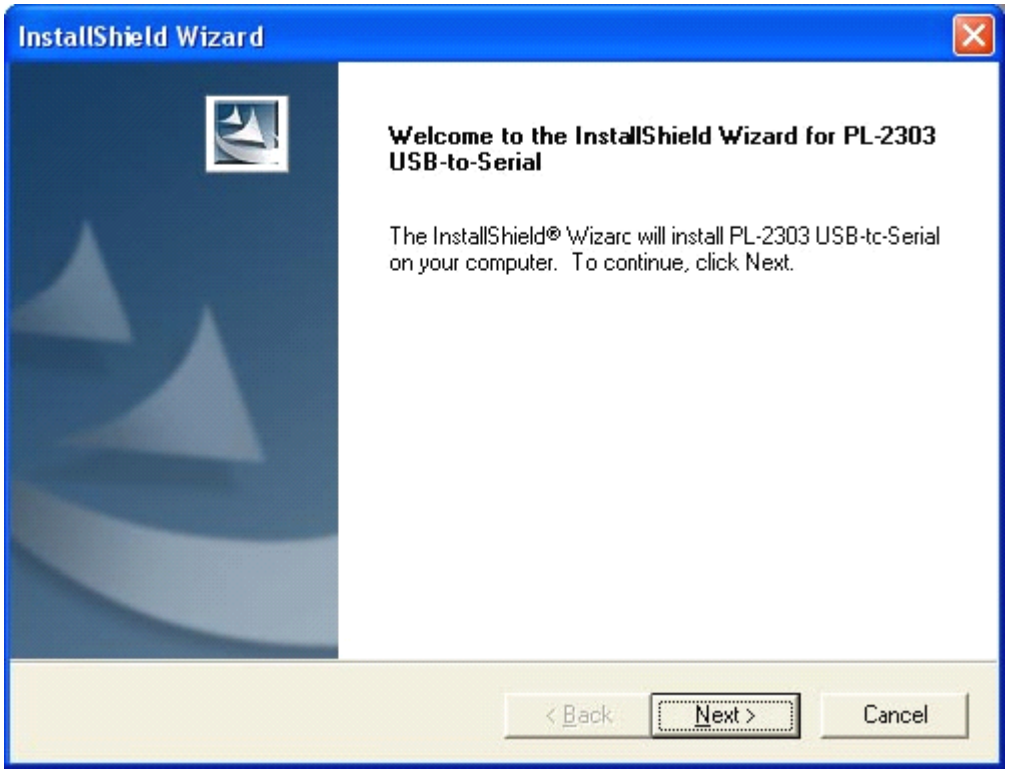
			0.1m/S'2 B= [0,2000] deceleration 0.1m/S'2
40	ACK function	*$$$$$$,123,X#	X = 0 (default), ACK function off X = 1, open the ACK function
41	Call filtering	*$$$$$$,130,X,Y#	X = 0 (default), disable this feature X = 1, turn on this feature. Y, caller location information to allow the telephone number of replies
42	Current Date Information print command	*$$$$$$,992,1#	$$$$$$ On behalf of the machine password 1 for print 10 random speed value
43	Assign Date exist Information print command	*$$$$$$,993,AABBCC,XXYYZZ,D#	$$$$$$ On behalf of the machine password, AABBCC on behalf of print date XXYYZZ on behalf of print time D=0 means according to date and time of the specified time and print the speed of the front nine seconds D=1 according to random print date said the speed of ten seconds eg:*000000,993,120321,084130,0# AA : 2012, taking two 12 BB : February CC: On the 20th XX: 8 hours YY: 41 minutes ZZ: 30 seconds 0 means according to date and time of the specified time and print the speed of the front nine seconds

44	Assign Date exist Information uploaded to the server Command	*$$$$$$,994,XXYYZZ#	$$$$$$ On behalf of the machine password, XXYYZZ on behalf of uploaded to the server date eg:*000000,994,120220# XX : 2012, taking two 12 YY : February ZZ : On the 20th
45	Output assign Date exist Information through the serial port out Command	*$$$$$$,995,XXYYZZ#	$$$$$$ On behalf of the machine password, XXYYZZ on behalf of serial port out date eg:*000000,995,120220# XX : 2012, taking two 12 YY : February ZZ : On the 20th
46	Output Driver Information through the serial port out Command	*$$$$$$,996#	$$$$$$ On behalf of the machine password Output drivers of the information
47	Set to drive for too long alarm time	*$$$$$$,30,AABBCC,XXYYZZ#	AABBCC, Single drive for too long alarm time XXYYZZ, Accumulated driving time is too long alarm time eg.*000000,030,000208,001310# 000208 on behalf of a single drive time of more than 0 hours, 2 minutes and 8 seconds, the system will issue a single drive for too long the alarm. 001310 on behalf of accumulated driving time of more than 0 hours 13 minutes 10 seconds, the system will send the accumulated driving time is too long alarm

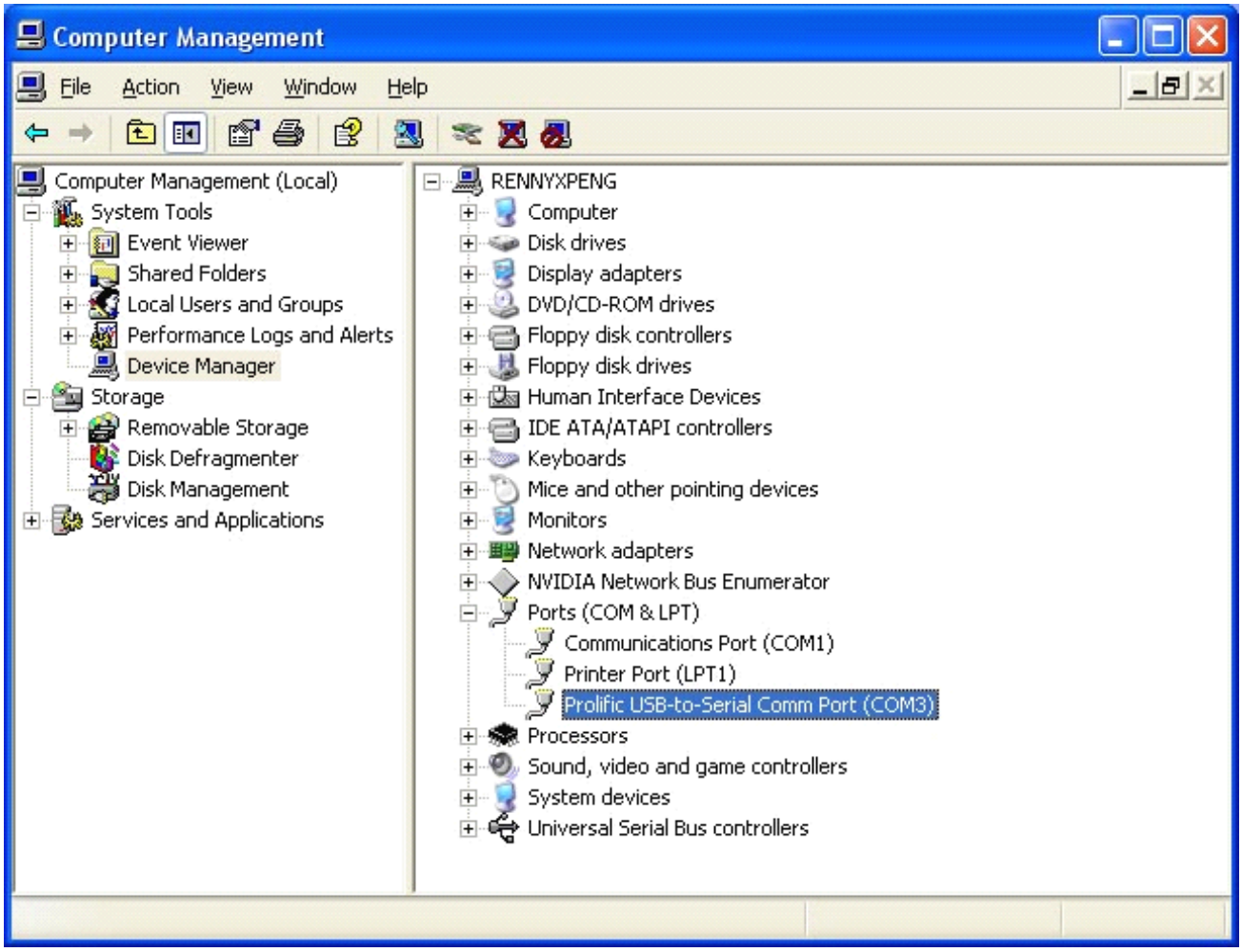
5. Update the firmware of the VN

1）Install RS232 cable driver

A. At the first, Install the Driver for "USB Converter"


InstallShield Wizard
Welcome to the InstallShield Wizard for PL-2303 USB-to-Serial
The InstallShield® Wizarc will install PL-2303 USB-tc-Serial on your computer. To continue, click Next.
< Back
Next >
Cancel

B. Connect the AVL unit to PC through RS232 cable, View the com port that the cable used

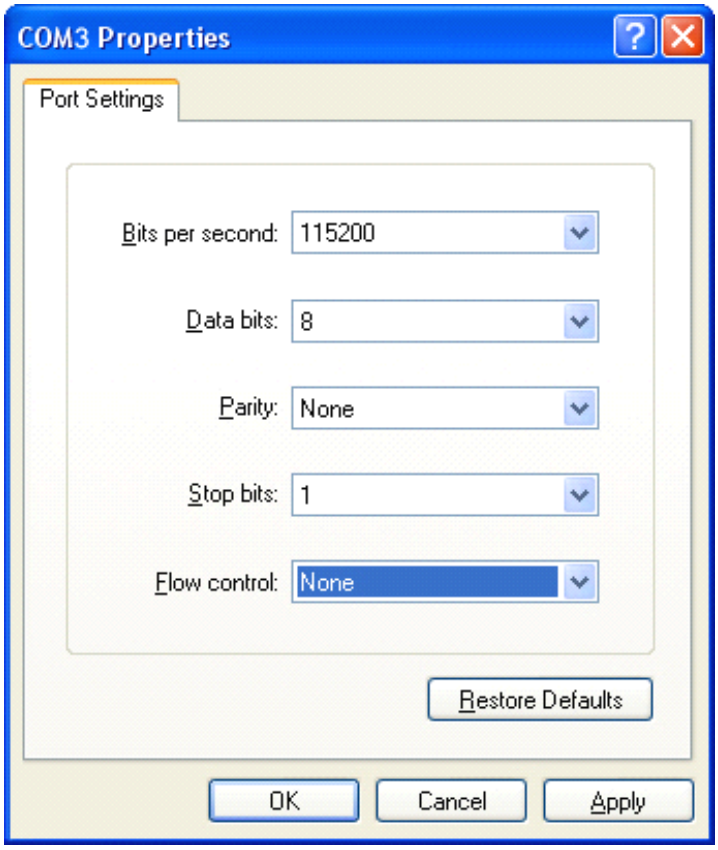


2）Turn on AVL device

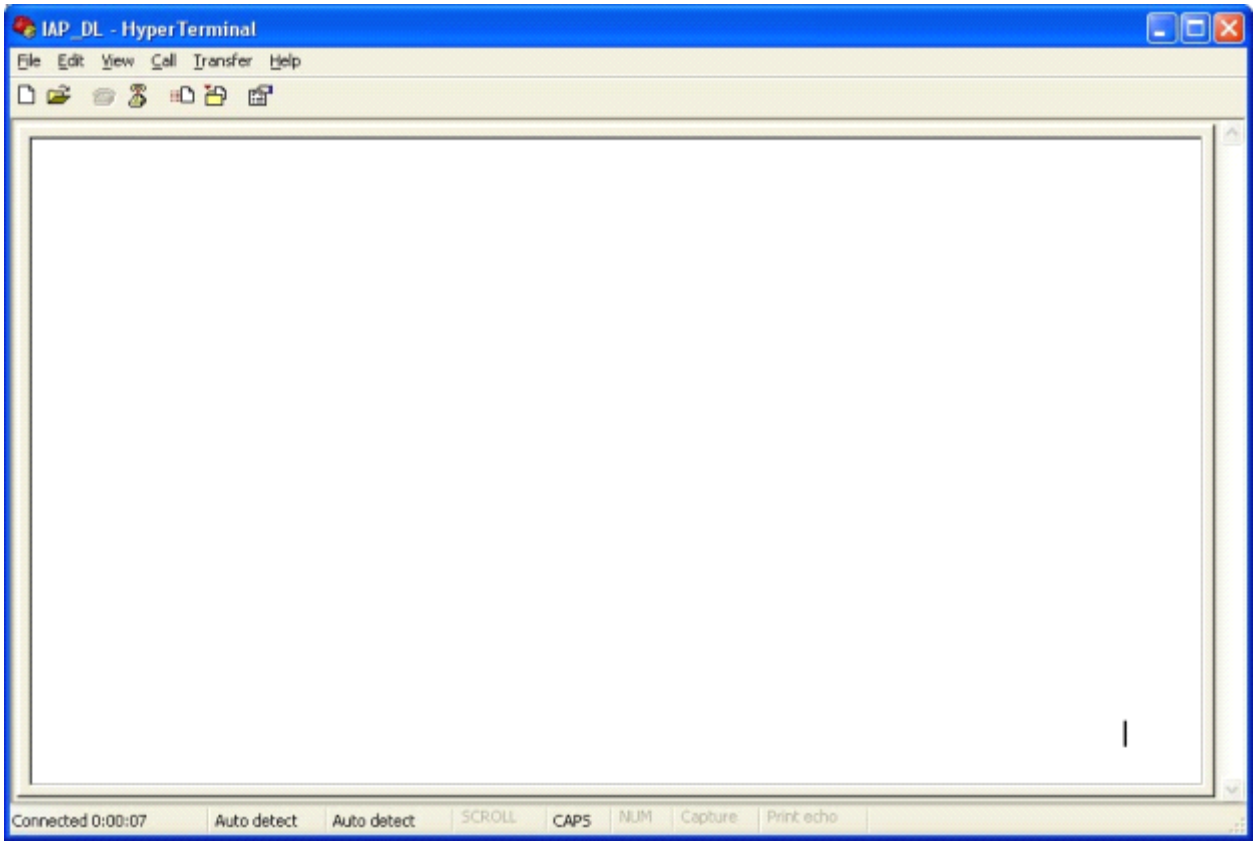
3）Build a New Hyper terminal connect, fill the name, example as IAP_DL

4）Choose the Com Port that the RS232 Cable used

Setup all the option like show in the picture follow

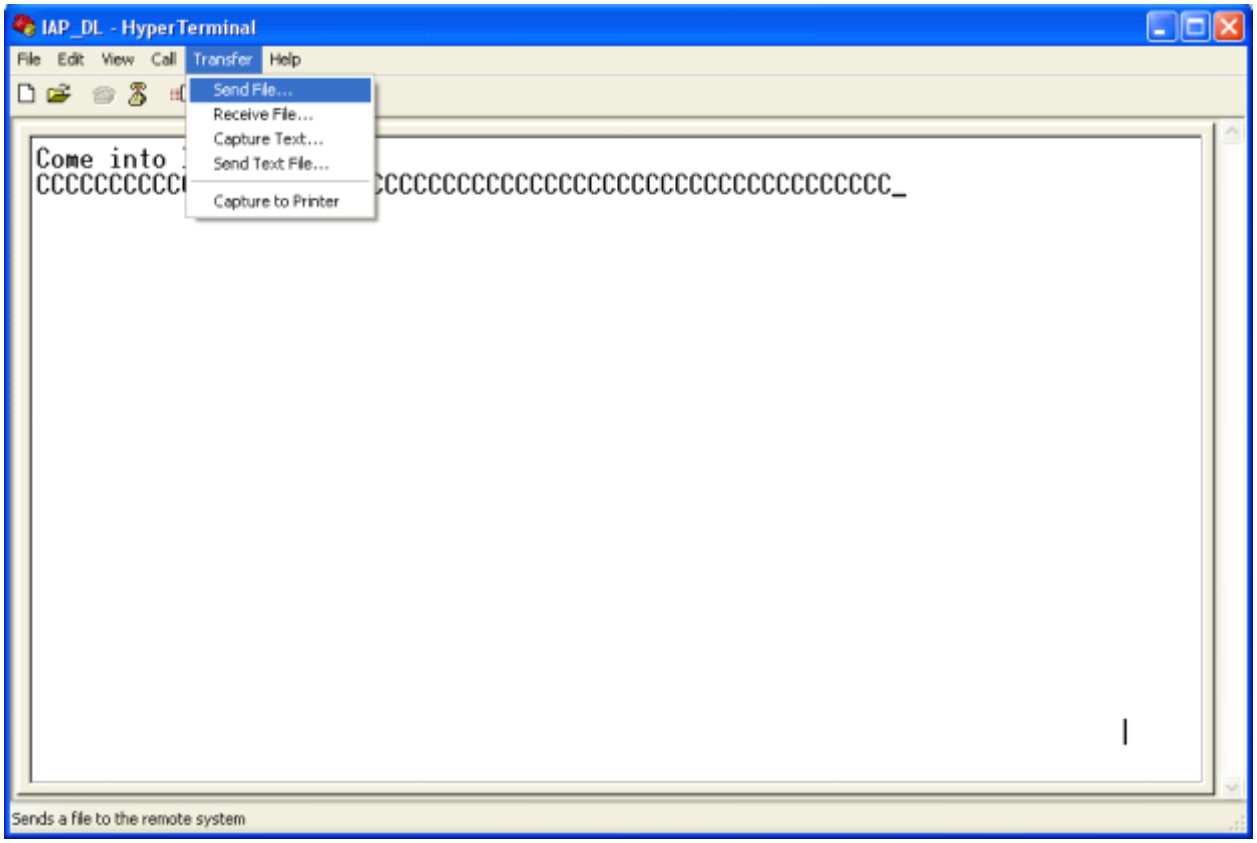


5）Into Configure Mode



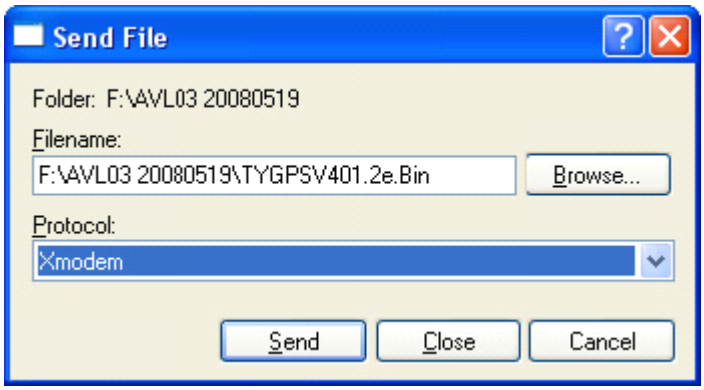
6）Turn Off VN device

7）Press the Unit's SOS button and Turn on Power(Please hold it for several seconds)，Unit's GSM/GPS/Sensors LED will still light at same time，Hyper terminal will display the interface like the picture follow. Then choose Send file（Send-> Send File）

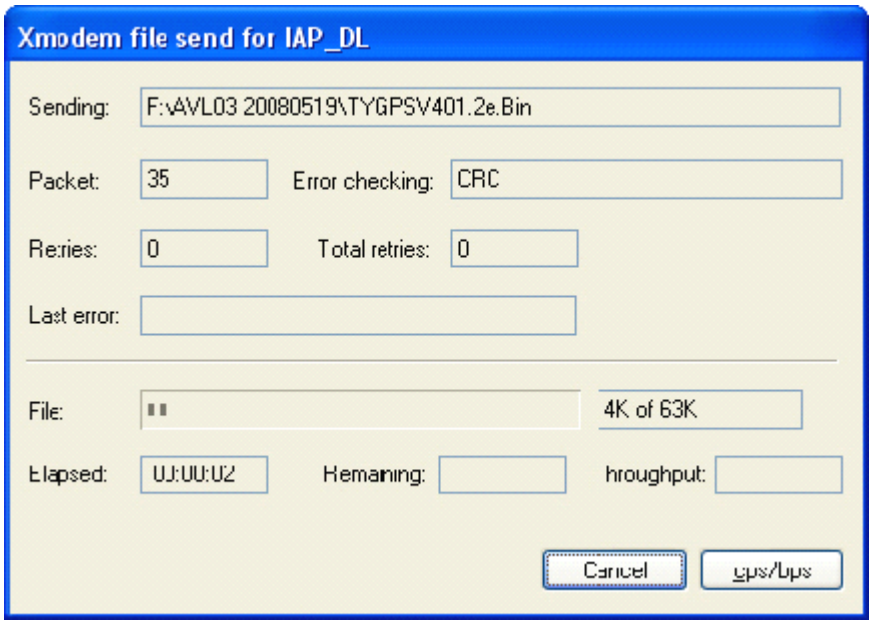


Choose the firmware that you want to Update;

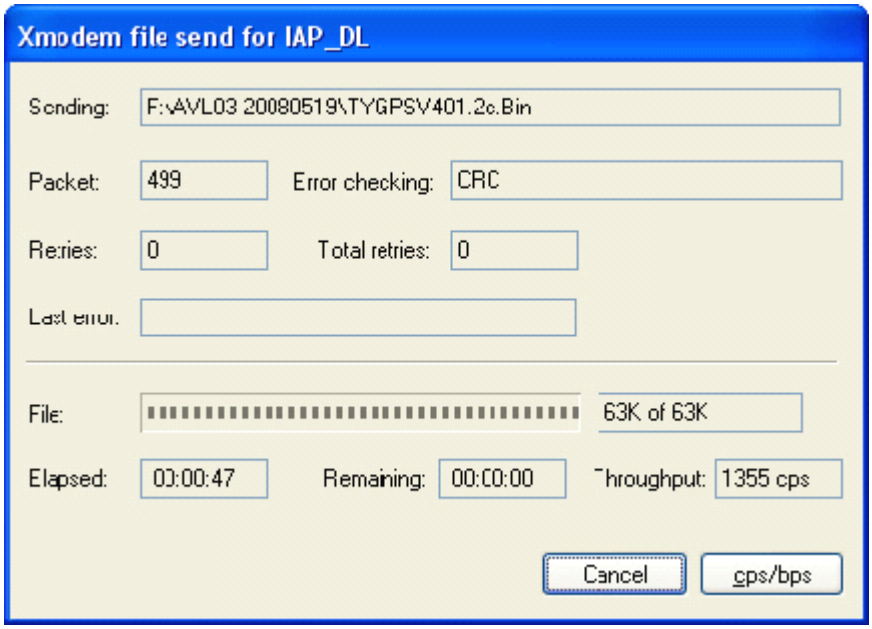
Protocol Choose: Xmodem



Press Send button, Will display a New Windows that show the update process.



(6) When finish Update, Tracker will reboot automatically, and the GSM/GPS/Sensors light will blink quickly. After about 3-5 mins, this interface will shut by itself. When the update is pressing, all indicator will off for 10 seconds, doesn't turn off power of AVL08, otherwise will cause MCU broken.



(7) When the AVL08 LED is blinking back to normal mode. Make sure about 2 mins later, then turn Off and Turn On AVL08 again.(at this times the firmware will load the parameter to the unit). Then the firmware updates finished.

6 Worldwide APN (Access Point Name) List

Country	Mobile operator	Access point name
Argentina	Personal	gprs.personal.com
Argentina	Unifon	internet.gprs.unifon.com.ar
Australia	Telstra	telstra.internet
Australia	Optus	internet
Australia	Three	3netaccess
Australia	Vodafone	internet
Austria	Max Online	gprsinternet
Austria	One	wap.one.at
Belgium	Orange	orangeinternet
Belgium	Mobistar	web.pro.be
Belgium	Proximus	internet.proximus.be
Bermuda	AT&T	proxy
Bermuda	Mobility	net.bm
Brazil	Claro	claro.com.br
Brazil	Oi	gprs.oi.com.br
Brazil	TIM	tim.br
Bulgaria	Mobiltel (Mtel)	inet-gprs.mtel.bg
Canada	Fido	internet.fido.ca
Canada	Rogers AT&T	internet.com
Chile	Entel PCS	imovil.entelpcs.cl bam.entelpcs.cl
Chile	Telefonica GSM	web.tmovil.cl
China	China Mobile	cmnet
Croatia	VIPNET	gprs.vipnet.hr
Czech Republic	Eurotel	internet
Czech Republic	Oskar	internet
Czech Republic	Oskar prepaid cards	ointernet
Czech Republic	T-Mobile	internet.t-mobile.cz

Denmark	TDCmobil	internet
Denmark	Orange	web.orange.dk
Eygpt	Vodafone	internet.vodafone.net
Dominican Republic	Orange Dominicana	orangenet.com.do
Finland	Telia Mobile	internet
Finland	DNA	internet
Finland	Sonera	internet
Finland	Radiolinja	internet
Finland	Saunalahti	saunalahti
France	Orange	orange.fr
France	SFR	websfr
France	Bouygues Telecom	eBouygTel.com
Germany	D2 Vodafone	web.vodafone.de
Germany	E-Plus	internet.eplus.de
Germany	O2	internet
Germany	Quam	quam.de
Germany	T-Mobile D1	internet.t-d1.de
Greece	Vodafone	internet.vodafone.gr
Greece	Telestet	gint.b-online.gr
Greece	Cosmote	internet
Hungary	Vodafone (Prepaid "Optimized")	vitamax.internet.vodafone.net
Hungary	Vodafone (Prepaid "Standard")	vitamax.snet.vodafone.net
Hungary	Vodafone (Postpaid "Optimized")	internet.vodafone.net
Hungary	Vodafone (Postpaid "Standard")	standardnet.vodafone.net
Hong Kong	CSL	internet
Hong Kong	Orange	web.orangehk.com
Hong Kong	New World	internet
Hong Kong	People	internet
Hong Kong	SmarTone	internet

Hong Kong	Sunday	internet
India	Orange, Hutch	www
Iceland	Siminn	gprs.simi.is
India	BPL Mobile	bplgprs.com
India	Airtel	airtelgprs.com
Indonesia	Telkomsel	internet
Ireland	O2	internet
Ireland	Vodafone	live.vodafone.com
Israel	Cellcom	internetg
Israel	Orange	internet
Italy	TIM	uni.tim.it ibox.tim.it
Italy	Vodafone Omnitel	web.omnitel.it
Italy	Wind	internet.wind
Latvia	Latvia Mobile Telefone	internet.lmt.lv
Luxembourg	LUXGSM	web.pt.lu
Luxembourg	Tango	internet
Malaysia	Celcom	celcom.net.my
Mexico	Movistar	internet.movistar.mx
Mexico	Telcel	internet.itelcel.com
Montenegro	Monet	gprs.monetcg.com
Netherlands	T-Mobile	internet
Netherlands	KPM Mobile	internet
Netherlands	Orange	internet
Netherlands	O2	internet
Netherlands	Vodafone (normal)	web.vodafone.nl
Netherlands	Vodafone (business)	office.vodafone.nl
New Zealand	Vodafone NZ	www.vodafone.net.nz
Norway	Netcom	internet.netcom.no

Norway	Telenor	internet
Pakistan	UFone	ufone.internet
Paraguay	Personal	internet
Paraguay	Tigo	internet.tigo.py
Philippines	Smart	internet
Philippines	Globe	internet.globe.com.ph
Poland	Era	erainternet
Poland	Idea	www.idea.pl
Poland	PlusGSM	www.plusgsm.pl
Portugal	Optimus	internet
Portugal	TMN	internet
Portugal	Vodafone (Telcel)	internet.vodafone.pt
Romania	Connex	internet.connex.ro
Romania	Orange	internet
Russia	BeeLine	internet.beeline.ru
Russia	Megafon	internet.nw
Russia	MTS	internet.mts.ru
Russia	PrimTel	internet.primtel.ru
Saudi Arabia	Saudi Telecom	Jawalnet.com.sa
Serbia-Montenegro	Mobtel Srbija	internet
Serbia-Montenegro	Telekom Srbija	gprsinternet
Singapore	M1	sunsurf
Singapore	Singtel	internet
Singapore	Starhub	shwapint
Slovakia	Eurotel	internet
Slovakia	Orange	internet
South Africa	MTN	internet
Spain	Amena	amenawap

Spain	Telefonica (Movistar)	movistar.es
Spain	Vodafone	airtelnet
Sweden	Telia	online.telia.se
Sweden	Vodafone SE	internet.vodafone.net
Switzerland	Swisscom	gprs.swisscom.ch
Switzerland	Orange CH	internet
Switzerland	sunrise	internet
Switzerland	UMC	www.umc.ua
Taiwan	Chunghwa Telecom	internet
Taiwan	Far EasTone	fetnet01
Taiwan	KG Telecom	internet
Taiwan	Taiwan Cellular	internet
Thailand	AIS	internet
Thailand	DTAC	www.dtac.co.th
Turkey	Avea	internet
Turkey	Aycell	aycell
Turkey	Telsim	telsim
Turkey	Turkcell	internet
UK	Jersey Telecom	pepper
UK	O2	mobile.o2.co.uk
UK	T-Mobile	general.t-mobile.co.uk
UK	Vodafone UK	internet
UK	Orange	orangeinternet
Ukraine	Kyivstar GSM	www.kyivstar.net
Ukraine	UMC	www.umc.ua
USA	T-Mobile	internet2.voicestream.com
USA	AT&T	proxy
USA	Cingular	isp.cingular
Venezuela	Digital TIM	gprsweb.digitel.ve